Unit-2 Mastery Assessment (version 601)

Question 1 (10 points)

Let f represent a function. If $f[30] = 45$, then there exists a knowable solution to the equation below.

$$y = \frac{f\left[\frac{x}{4} + 25\right]}{5} + 3$$
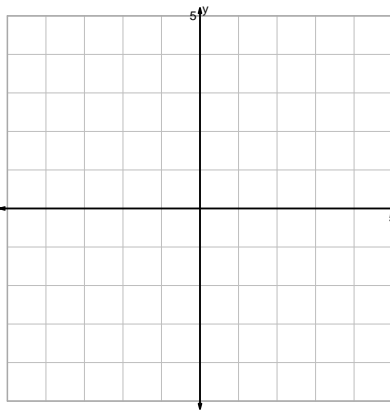
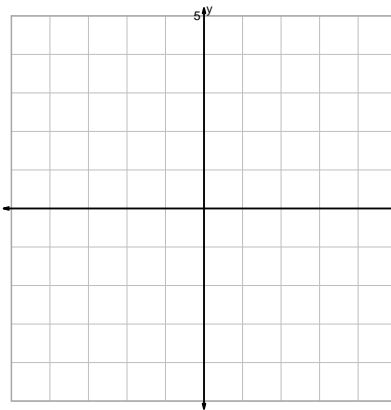Find the solution.

$x =$

$y =$

Question 2 (20 points)

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.
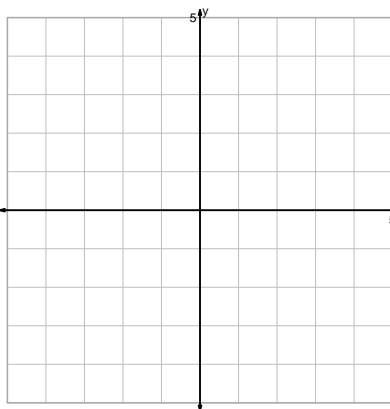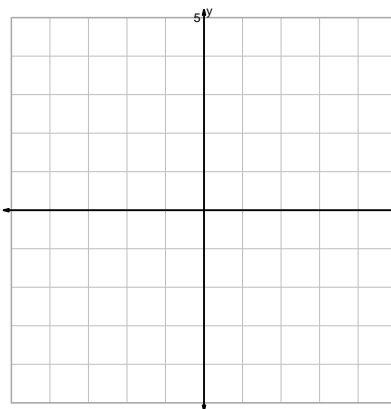
$y = \log_2\left(-x\right)$
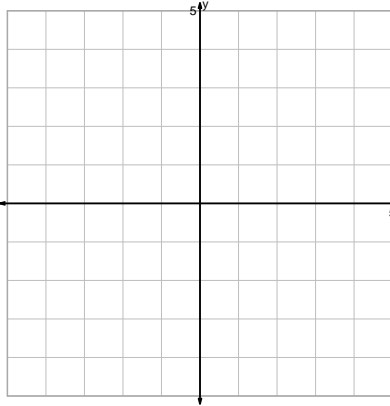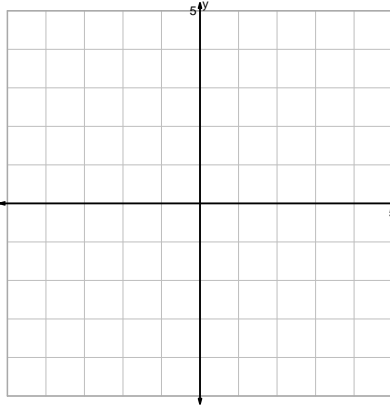
$y = \sqrt{x+2}$

$y = -\sqrt{x}$

$y = \dfrac{x^2}{2}$
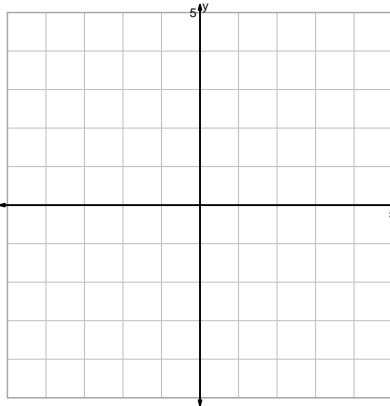
$$y = 2 \cdot \log_2\left(x\right)$$
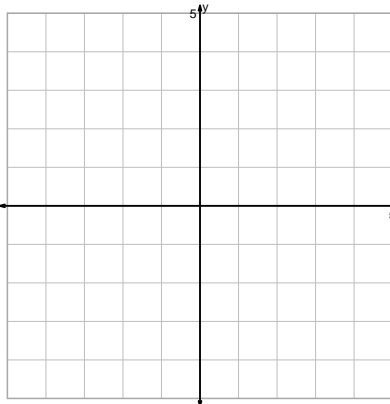
$$y = 2^{\frac{x}{2}}$$
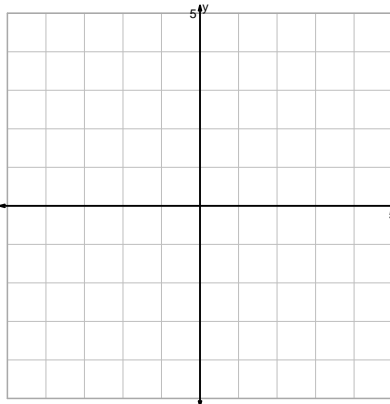
$$y = \left(x - 2\right)^2$$
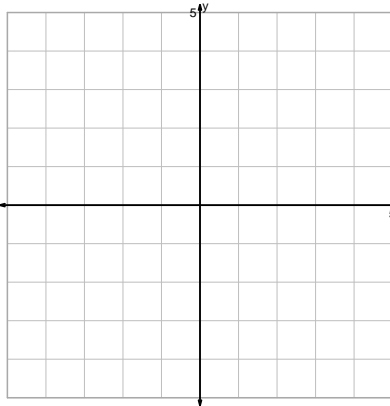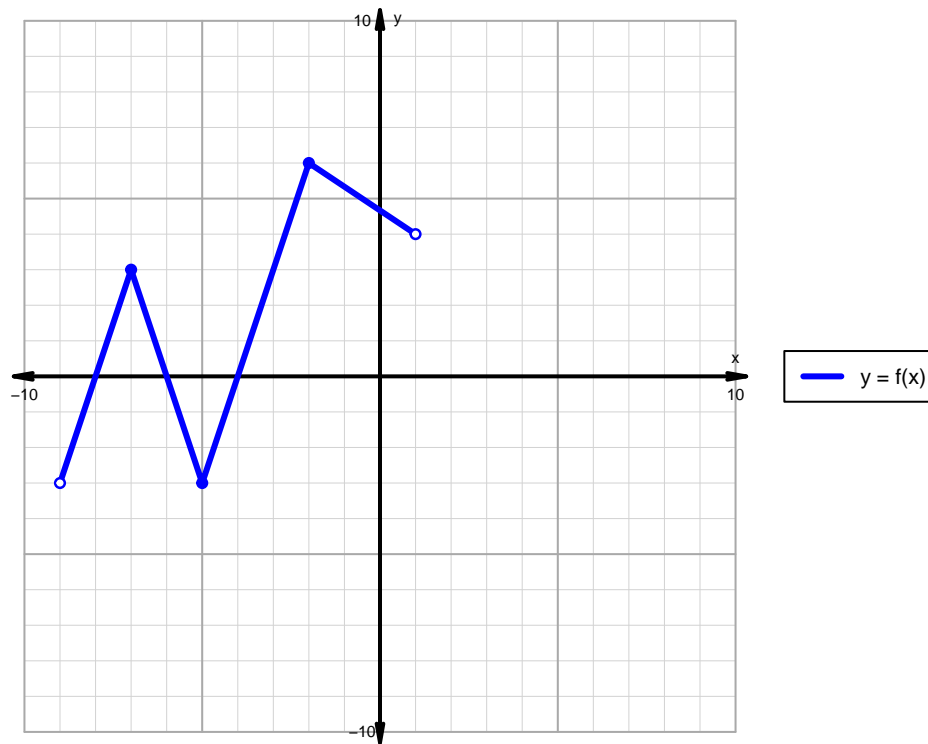
$$y = \sqrt[3]{2x}$$

$$y = x^3 - 2$$

$$y = \sqrt[3]{x} + 2$$
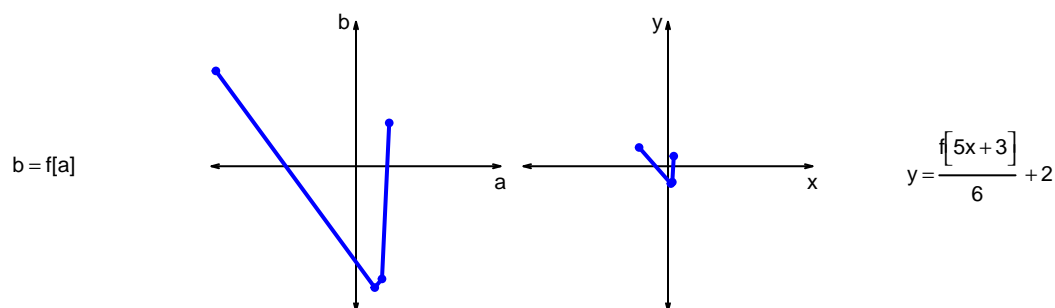
Question 3 (20 points)

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4 (20 points)

Let f represent a function. The curves $b = f[a]$ and $y = \frac{f[5x+3]}{6} + 2$ are represented below in a table and on graphs.

a	b	x	y
-97	66	-20	13
13	-84	2	-12
18	-78	3	-11
23	30	4	7

b = f[a]

$$y = \frac{f\left[5x+3\right]}{6} + 2$$

a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = \frac{f[5x+3]}{6} + 2$?

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Question 5 (10 points)

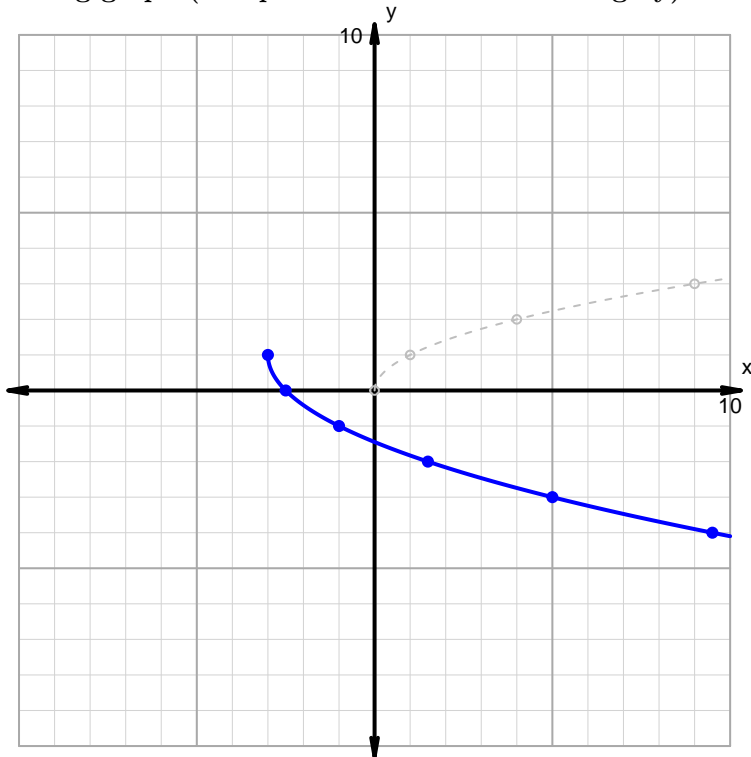A parent square-root function is transformed in the following ways:

Horizontal transformations

1. Horizontal shrink by factor 2.
2. Translate left by distance 3.

Vertical transformations

1. Translate down by distance 1.
2. Vertical reflection over x axis.

Resulting graph (and parent function in dashed grey):

- What is the equation for the curve shown above?

Question 6 (20 points)

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{2} \cdot |x + 5| - 1$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	